

## **KAHO`OLAWE ORDNANCE CLEARANCE UPDATE: INNOVATION, INTEGRATION, PRODUCTION**

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**Abstract:** The Kaho`olawe ordnance clearance contract awarded in July 1997 valued at \$280 million is the largest UXO clearance contract ever awarded by DOD. This contract has a number of unique features that are new to the UXO arena including use of award fee to incentivize innovation, integration of investigation and remediation phases of clean up, and use of performance oriented specifications. This paper will provide an update on the project now into its first year of full production. In addition "lessons learned" will be presented on management of large, complex UXO contract efforts including a discussion on current results of incentives and introduction of new technologies.

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**Background:** The 29,000 acre island of Kaho`olawe was an active live-fire range for fifty years. Every type of conventional ordnance from small arms to the largest classes of air and ship delivered munitions are found on the island. The presence of pyrotechnics, rocket propellants, igniters, and submunitions compound the difficulty of the clearance task. To make the project more challenging Kaho`olawe is remote (seven miles south of Maui), without infrastructure or fresh water, and has high ferrous content in rocks and soil.<sup>1</sup>

Special legislation was passed in 1993 that transferred title of the island to the State of Hawaii, provide direction to the Navy for island clearance, and established a special trust fund with a \$400 million ceiling for clearance and restoration. The restoration responsibility is given to the State of Hawaii, Kaho`olawe Island Reserve Commission (KIRC) and 11% of all trust fund monies appropriated go to the state for that purpose.<sup>2</sup> Site work must be completed by November 2003. Funds appropriated as treated as "no year" and do not expire at the end of the fiscal year appropriated.

In July 1997 Pacific Division awarded a contract to a joint venture of Parsons Infrastructure and Technology Group and UXB International (PUXB). In July 1998 the Navy approved the cleanup plan and mobilization commenced.

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<sup>1</sup> For a more complete discussion see Cleanup Plan, UXO Clearance Project Kaho`olawe Island Reserve, Hawaii, Contract No.: N62742-95-D-1369, prepared by Parsons-UXB Joint Venture, April 27, 1998. Text portions of the plan are available at [www.efdpac.navy.mil](http://www.efdpac.navy.mil).

<sup>2</sup> Title X of the Fiscal Year 1994 Department of Defense Appropriations Act (PL 103-139, 107 Stat. 1418. 1479-1484).

**Work in Progress:** As of April 1999 contract task orders (TO) have been issued for the following tasks:

- TO 1: Partnering
- TO 2: Program management office (PMO)(first program year)
- TO 3: Base camp operations, first year
- TO 4: PMO building renovations
- TO 5: Administrative matters
- TO 6: Base camp health and safety related construction
- TO 7: Area pre-investigation/area assessment first increment (2176 acres).
- TO 8: UXO clearance first increment
- TO 9: Base Camp improvements
- TO 10: Island Infrastructure construction
- TO 11: Base camp operations, second year
- TO 12: Field equipment for UXO clearance
- TO 13: Transportation
- TO 14: PMO second year
- TO 15: Area Assessment, second increment (3511 acres)
- TO 16: UXO clearance second increment (award in progress)
- TO 17: Special escort
- TO 18: Install perimeter warning signs.

Contract obligations as of April 1999 are \$34.6 million. Task order seven area assessment work (survey, historic property assessment, natural resource assessment, initial UXO assessment, and surface preparation) is nearing completion. The crews will roll into TO 15. TO 8 UXO operations are underway with surface clearance well underway including blow-in-place (BIP) operations. Subsurface detection, excavation, and disposal have commenced. TO 8 crews will roll into TO 16. Project planning contemplates a production line approach for the life of the projects with annual increments identified and given to the contractor. This, of course, is dependent on annual appropriations from congress and assumes full project funding by fiscal year 03.

The KIRC provides the sequencing of areas to be cleared based on its use plan and its priorities for cleanup. The KIRC also will identify areas for surface clearance only or, based on the land use plan, areas requiring subsurface clearance. For example, the areas identified in the first increment included areas necessary for infrastructure to support and facilitate the cleanup and the priority areas identified by the KIRC for planting to meet a land use priority of controlling erosion. Almost one-half of the subsurface clearance areas will be accomplished in the first two years of production and almost all of TO's 8 and 16 are subsurface. This fact accounts for the fact that thousands of acres of work are in progress, but that only a few acres have been completed as of this writing.

**Integration of UXO related work with non-UXO work:** The ramping up to full UXO production has been slow and deliberate. The need to plan and design infrastructure improvements to support the long term nature of the operations and determine which improvements will be temporary for the life of the Navy contract and which would be

designed for long term use by the state has been complicated. Among the infrastructure items being designed are road construction of the eleven mile “K-1” road, currently a rutted jeep track, a range control facility which will be transitioned to an administrative office for the KIRC at contract completion, water systems, a temporary airfield or system of helicopter pads (currently being analyzed), and base camp improvements to support long term use for the contract and post-contract KIRC use. The contract value of all infrastructure improvements result from engineering trade off analyses that show cost of construction will be offset by decreased production and logistics support costs.

Another challenge being met by the contractor is provision of UXO escorts to regular visitors to the island, primarily the Protect Kaho`olawe Ohana whose access rights were set out in a federal court consent decree.<sup>3</sup> Navy EOD personnel provided escorts in the past but staffing limitations required the service to transition to the contractor. Having regularly scheduled civilian visitors to an active range in clearance poses additional requirements on scheduling UXO operations.

**Technology and innovation:** The Geonics EM-61 time domain electromagnetic (TDEM) operated in the audio mode (“mag and flag”) still is the best technology and platform for achieving the required probability of detection<sup>4</sup> and maintain required production rates. The EM-61 operated in the data recording mode is used for quality control. Proposals are currently under review for field-testing the Geonics EM-63. In addition, a number of data processing improvements, primarily coming out of the Jefferson Proving Ground Phase IV, are being actively reviewed. Kaho`olawe is being considered as a site for UXO technology validation. The site is attractive in this light due to the long-term nature of the process, the large spectrum of UXO types found, and the data management system developed.

Innovation is not limited to UXO detection and discrimination technologies. The contractor is motivated and rewarded by an award fee for bringing any creative or innovative ideas to the project that will have a beneficial impact on cost, productivity, or value.<sup>5</sup> As the table below shows, opportunities for cost savings and innovation run for all areas of the project.

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<sup>3</sup> *Aluli et.al. v. Brown*, Federal District Court in Hawaii, partial judgement in 1977, consent decree in 1980.

<sup>4</sup> Department of Defense Standard: DoD 6055.9-STD, DOD Ammunition and Explosive Safety Standards, Chapter 12.

<sup>5</sup> Putnam, James D., “Acquisition Strategy for Large Ordnance Clearance Contracts-The Kaho`olawe Approach: A Model for the Future.” Proceedings of the DOD UXO Forum 1998.

**Table 1**  
**Contract Cost Distribution: Percent of Total Price<sup>6</sup>**

Program Management	5.0%
Project Management	4.7%
Base Camp support	5.2%
Equipment and Supplies	5.0%
Transportation	23.8%
Mob & Training	2.5%
Pre-investigation	0.5%
Survey & Mapping	4.2%
Assessment (HP)	6.1%
Assessment (Other)	5.2%
Area Preparation	6.2%
Surface Sweep	5.5%
Subsurface Detection	4.6%
Excavation	6.5%
UXO ID & Assessment	2.2%
UXO/OE Destruction	1.7%
Debris Management	5.9%
Institutional Controls	0.9%
Quality Management	4.4%
Total	100.1%
(Slight rounding error)	

Given a \$280 million contract effort, targets of opportunity for innovation and cost savings become apparent. The contractor has made innovations in numerous areas. Examples include reconfiguration of assessment teams for better work flow, combination of area preparation and surface sweep activities to give teams “ownership” of areas, designs for infrastructure using creative and cost effective materials, and bar coding for computerized property management.

**Production:** The definition of success for this cleanup is 100% surface and 30% subsurface clearance of the island’s land area.<sup>7</sup> Based on information available in 1994, this seemed to be the amount of clearance that could reasonably accomplished within the funds identified. The areas identified for clearance by the KIRC are provided using the 100%/30% standard. The project goal is to exceed this standard. This will limit long term liability of the Government by reducing the overall ordnance contamination of the island and provide a greater area for reasonable use by the State of Hawaii and the public. All cost saving realized through innovative management and technologies have the affect of allowing more areas to be cleared.

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<sup>6</sup> Prepared by Parsons-UXB under contract N62742-95-D-1369.

<sup>7</sup> Memorandum of Understanding between the United States Department of the Navy and the State of Hawaii Concerning the Island of Kaho`olawe, Hawaii. May 6, 1994.

The project over the last eighteen months has put in place the plans, standard operating procedures, infrastructure design, and improvements necessary to sustain a large clearance effort. The full range of UXO operations including surface and subsurface detection, identification, disposal, and material screening and disposition is now underway. To meet project goals we will have to maintain a 5000 acres per year production rate.

**Summary:** The Kaho`olawe UXO clearance project is the largest ever attempted by the Department of Defense. Valuable lessons in planning and executing a program of this size are produced daily. The factors that will increase the probabilities of meeting project's goals are a contract incentivizing contractor creativity and innovation, planning and providing infrastructure with long term paybacks, and a firm commitment to the project by all the partners: the Navy, the KIRC, and the contractor.

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James D. Putnam is the Kaho`olawe Project Director for the Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. In this capacity he directs a full time staff of engineers, contract specialists, EOD specialists, construction managers, and archaeologists. Mr. Putnam has over twenty-five years experience as a contract manager serving in positions with the Navy and Air Force before his assignment as the project director. He has a B.A. from DePauw University and a J.D. from the University of Iowa College of Law. Mr. Putnam is a graduate of the University of Hawaii College of Business Administration Advanced Management Program.